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## NOTICE OF ALLOWANCE AND FEE(S) DUE

32215 7590 03/10/2010

KLARQUIST SPARKMAN, LLP  
121 SW SALMON STREET, SUITE 1600  
ONE WORLD TRADE CENTER  
PORTLAND, OR 97204

EXAMINER

LEWIS, BEN

ART UNIT

PAPER NUMBER

1795

DATE MAILED: 03/10/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/714,180

11/14/2003

Peter C. Rieke

50005-162

9390

TITLE OF INVENTION: COPPER-SUBSTITUTED PEROVSKITE COMPOSITIONS FOR SOLID OXIDE FUEL CELL CATHODES AND OXYGEN REDUCTION ELECTRODES IN OTHER ELECTROCHEMICAL DEVICES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional

YES

\$755

\$300

\$0

\$1055

06/10/2010

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

#### I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE  
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

32215 7590 03/10/2010

**KLARQUIST SPARKMAN, LLP**  
121 SW SALMON STREET, SUITE 1600  
ONE WORLD TRADE CENTER  
PORTLAND, OR 97204

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/714,180 11/14/2003 Peter C. Rieke 50005-162 9390

TITLE OF INVENTION: COPPER-SUBSTITUTED PEROVSKITE COMPOSITIONS FOR SOLID OXIDE FUEL CELL CATHODES AND OXYGEN REDUCTION ELECTRODES IN OTHER ELECTROCHEMICAL DEVICES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional YES \$755 \$300 \$0 \$1055 06/10/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
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LEWIS, BEN 1795 429-012000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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10/714,180	11/14/2003	Peter C. Rieke	50005-162	9390
32215	7590	03/10/2010	EXAMINER	
KLARQUIST SPARKMAN, LLP 121 SW SALMON STREET, SUITE 1600 ONE WORLD TRADE CENTER PORTLAND, OR 97204			LEWIS, BEN	
			ART UNIT	PAPER NUMBER
			1795	
DATE MAILED: 03/10/2010				

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 212 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 212 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/714,180	RIEKE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ben Lewis	1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Interview on 2/23/2010.
2. ☒ The allowed claim(s) is/are 1-10,13-29,32-38,100, 101,103-120,122-128 and 130-132.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
  - \* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. <input type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br/>Paper No./Mail Date _____</li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br/>of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application</li> <li>6. <input type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date _____.</li> <li>7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other _____.</li> </ol> |
|---|---|

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795

## **DETAILED ACTION**

### ***Election/Restrictions***

Claim 1 is allowable. Claims 100,101, 103-111, previously withdrawn from consideration as a result of a restriction requirement, requires all the limitations of an allowable claim. Pursuant to the procedures set forth in MPEP § 821.04(a), the restriction requirement among the inventions species, as set forth in the Office action mailed on 1/12/2007, is hereby withdrawn and claims 100,101, 103-111 hereby rejoined and fully examined for patentability under 37 CFR 1.104. In view of the withdrawal of the restriction requirement, applicant(s) are advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once the restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

### **Examiners's Amendment**

An examiner's amendment on the record appears below. Should changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ms. Gillian Gardner on February 24<sup>th</sup>, 2010. The application has been amended as Follows:

### **IN THE CLAIMS**

1.(Previously presented) A solid oxide fuel cell for electrochemically reacting a fuel gas with an oxidant gas to produce a DC output voltage, said solid oxide fuel cell comprising:

a layer of ceramic ion conducting electrolyte defining first and second opposing surfaces; a conductive anode layer positioned at the first surface of said electrolyte layer; and a conductive cathode layer positioned at the second surface of said electrolyte layer; wherein said electrolyte layer is disposed between said anode layer and said cathode layer;

wherein said conductive cathode layer ~~comprises~~ consists essentially of a copper-substituted ferrite perovskite material and the copper-substituted ferrite perovskite

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material is in contact with said electrolyte layer;

wherein said solid oxide fuel cell is operable at temperatures less than about 750 °C.

18. (Original) The fuel cell in accordance with claim 1 wherein said cathode layer ~~comprises~~ consists essentially of a perovskite composition having the formula:



wherein x is from about 0.05 to about 0.6; y is from about 0.05 to about 0.5; x' is from 0 to about 0.5; and y' is from 0 to about 0.4.

20. (Previously presented) A solid oxide fuel cell assembly for electrochemically reacting a fuel gas with a flowing oxidant gas to produce a DC output voltage, said assembly comprising a plurality of integral fuel cell units, each unit comprising a layer of ceramic ion conducting electrolyte disposed between a conductive anode layer and a conductive cathode layer, and further comprising a metallic interconnect between the anode layer of a first fuel cell unit and the cathode layer of an adjacent second fuel cell unit; wherein the cathode layer of at least one of said fuel cells ~~comprises~~ consists essentially of a copper-substituted ferrite perovskite composition and the copper-substituted ferrite perovskite composition is in contact with said electrolyte layer; wherein said solid oxide fuel cell is operable at temperatures less than about 750 °C.

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37. (Original) The fuel cell assembly in accordance with claim 20 wherein said cathode layer ~~comprises~~ consists essentially of a perovskite composition having the formula:



wherein  $x$  is from about 0.05 to about 0.6;  $y$  is from about 0.05 to about 0.5;  $x'$  is from 0 to about 0.5; and  $y'$  is from 0 to about 0.4.

115. (Previously presented) A solid oxide fuel cell for electrochemically reacting a fuel gas with an oxidant gas to produce a DC output voltage, said solid oxide fuel cell comprising:

a layer of ceramic ion conducting electrolyte defining first and second opposing surfaces;

a conductive anode layer positioned at the first surface of said electrolyte layer; and

a conductive cathode layer positioned at the second surface of said electrolyte layer;

wherein said electrolyte layer is disposed between said anode layer and said cathode layer; and wherein said conductive cathode layer ~~comprises~~ consists essentially of a copper-substituted lanthanum ferrite perovskite material that includes at least one B-site dopant selected from the group consisting of nickel, cobalt, manganese, aluminum and chromium;

wherein said solid oxide fuel cell is operable at temperatures less than about 750 °C.



*128. (Previously presented) A solid oxide fuel cell assembly for electrochemically reacting a fuel gas with a flowing oxidant gas to produce a DC output voltage, said assembly comprising a plurality of integral fuel cell units, each unit comprising a layer of ceramic ion conducting electrolyte disposed between a conductive anode layer and a conductive cathode layer;*

*wherein the cathode layer of at least one of said fuel cells ~~comprises~~ consists essentially of a copper-substituted ferrite perovskite material that includes at least one B-site dopant selected from the group consisting of nickel, cobalt, manganese, aluminum and chromium;*

*wherein said solid oxide fuel cell is operable at temperatures less than about 750 °C.*

Claims 96-99 are cancelled.

### **REASONS FOR ALLOWANCE**

Claims 1-10,13-29,32-38,100, 101,103-120,122-128 and 130-132 are allowed.

The prior art does not teach or suggest a solid oxide fuel cell including all of the claimed features. The most pertinent art includes Aizawa et al. (US 6,692,855), Forthmann et al. (Ceramic coatings for cathode contacts of solid oxide fuel cells,

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Werkstoffwoche '98, Band II 1: Symposium 3, Werkstoffe fuer die Energietechnik; Symposium 7, Werkstoffe und Korrosion, Munich, Sept., 1998 (1999), Meeting Date 1998, 149-154, Kindermann et al. (J. Am. Ceram. Soc. 80 [4], 909-914 (1997.) and Sarkar et al. (U.S. Pub. No. 2003/0134176 A1).

The prior art references do not teach or suggest a solid oxide fuel cell assembly wherein “said conductive cathode layer consists essentially of a copper-substituted ferrite perovskite material and the copper-substituted ferrite perovskite material is in contact with said electrolyte layer”; As claimed by Applicant in claims 1 and 20.

The prior art references do not teach or suggest a solid oxide fuel cell assembly wherein “*said electrolyte layer is disposed between said anode layer and said cathode layer; and wherein said conductive cathode layer consists essentially of a copper-substituted lanthanum ferrite perovskite material that includes at least one B-site dopant selected from the group consisting of nickel, cobalt, manganese, aluminum and chromium*”; As claimed by Applicant in claim 115.

The prior art references do not teach or suggest a solid oxide fuel cell assembly wherein “*the cathode layer of at least one of said fuel cells-consists essentially of a copper-substituted ferrite perovskite material that includes at least one B-site dopant selected from the group consisting of nickel, cobalt, manganese, aluminum and chromium*”; As claimed by Applicant in claim 128.

For these reasons, the claims are allowed over the prior art. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Ben Lewis/  
Examiner, Art Unit 1795